

made. The Examiner points out that the polymers taught by '923 and '833 are taught by Applicants' specification Table 1 to have acceptable high Tg for the "first polymer".

Because the disclosures of '923 and '833 are so similar, for purposes of this response most of the remarks will reference '923. However, they apply equally well to '833.

The inventions disclosed in '923 and '833 require **only** the copolymer described above. That is, one containing the butyl (meth)acrylate and hydroxyalkyl (meth)acrylate monomers. As an option, the copolymer can contain one or more additional co-polymerizable monomers. However, these additional monomers are not required. The single polymer exemplified in the cited references does contain three monomers, 2-ethylhexyl acrylate, n-butyl acrylate, and 2-hydroxyethyl methacrylate. Furthermore, all of the examples in '923 have an additional optional polymer in the composition, as described below.

As an option, the composition may also comprise at least one constituent "known in the cosmetic arts that does not substantially interfere with the reshaping properties of the at least one (meth)acrylic copolymer." (see '923, page 5 [0050] and '833, page 4 [0043]) These optional constituents comprise a huge variety of polymers and copolymers (see '923, pages 5-14), as well as almost any material known to be useful in a hair styling composition. This listing of additional polymers and copolymers goes on for nine pages. It includes anionic, cationic, amphoteric, and nonionic polymers and combinations thereof. Applicants suggest that this includes virtually every known polymer. The Official Action points out a number of these optional polymers as being within the Tg range claimed by Applicants for their "first polymer". That is, from 75 to 130 deg. C. However, there is no disclosure, teaching, or suggestion in this huge, nine page list of polymers and copolymers that any one will have an advantage over any other for use in Applicants' claimed compositions, or, for that matter, for use in any of the compositions claimed in '923 or '833. There is no disclosure, teaching, or suggestion of the high Tg range claimed by Applicants as being particularly useful, only that the '923 and '833 compositions can contain the optional additional polymer. Furthermore, the only examples of the use of such optional polymers are disclosed in '923 Example 7, Formulations A-E which disclose the use of quaternary ammonium salt polymers (Merquat™ 100 and 500, and Salcare™ SC95). In addition, there are no data, no teaching, and no disclosure in either '923 or '833.

showing that there is any difference in the performance of the claimed reshaping compositions with or without the addition of the higher Tg polymer to the claimed (meth)acrylic copolymers. Therefore, there is no disclosure, teaching, or suggestion in '923 or '833 which would motivate one skilled in the art to add higher Tg polymers (i.e. first polymer) to Applicants' second polymer with the expectation of achieving an improved composition.

As importantly, however, are the suggestions, teachings, and disclosures of '923 and '833 which relate to the required (meth)acrylic copolymer. '923 and '833 teach that this copolymer should have a low Tg. It is Applicants position that the low Tg is required in order for the compositions claimed in '923 and '833 to be reshaping. That is, the copolymer must be tacky. The only embodiment which specifies a Tg range is found in '923 on page 5 [0045] and '833, page 4, [0038] and specifies a Tg range of -100 deg. C. to + 15 deg. C. This is significantly below the Tg range specified in Applicants' claims of +20 deg. C. to +35 deg. C for their "second polymer". Furthermore, in '923, the one working example of the (meth)acrylic polymer, Example 1, provides for a 2-ethyl hexyl acrylate (EHA), n-butyl acrylate (BA), 2-hydroxy ethyl methacrylate (HEMA) copolymer in the ratio of 60/35/5. Using the Fox equation:  $1/Tg(\text{polymer}) = 1/Tg(\text{monomer 1}) + 1/Tg(\text{monomer 2}) + 1/Tg(\text{monomer 3})$  and the standard Tg values of -85 for EHA, -54 for BA, and +55 for HEMA, one can calculate the Tg of the polymer of Example 1 of '923 as being -70 deg. C. Thus, one of ordinary skill in the art familiar with '923 and '833 would be motivated to use a low Tg copolymer to prepare the claimed compositions, not polymers with a Tg in the claimed range of Applicants' second polymer.

The Examiner correctly points out that '923 and '833 do not teach Applicants' copolymer with a Tg of 20-35 deg. C, but they do teach in claims 20 a Tg from about -100 deg. C to + 15 deg. C. The Examiner then states that it would have been obvious to one of ordinary skill in the art to look to '923 and '833 for the composition and then to optimize the Tg ranges (citing MPEP 2144.05). However, Applicants have shown that there is a significant difference between the Tg range disclosed in '923 and '833 and Applicants' claimed second polymer Tg range.

Applicants have indicated in the Specification, page 1, line 31 to page 2, line 2, that low Tg polymers have a benefit (not brittle so they do not fracture when stressed). But that they also have the disadvantage of being tacky and lack toughness. These disadvantages are overcome in

Applicants' claimed compositions (see Tables 3-4 and 6-7). In addition, Applicants' have provided data which clearly shows that low Tg polymers are not acceptable in Applicants' claimed compositions. See Table 6, examples 16d and 18d in particular when compared with the Tg of example 17d, which is within Applicants' claimed range. Example 17d has better overall properties. However, in all these examples, the low Tg polymer alone provided unacceptable film properties - Toughness and Tackiness. In addition, the high Tg polymers alone also had unacceptable film properties - Flexibility, when used alone. It is only in combinations of Applicants' second polymers with the claimed high Tg polymers (first polymers) that Applicants' compositions provide acceptable film properties (see Tables 3 and 4). Also, the data in Tables 3 and 4 demonstrate the uniqueness of the Tg range of Applicants' claimed second polymer. For example, in Table 3, examples 4a and 5a show that a low Tg second polymer has properties (toughness) that is less acceptable than when the Tg of the second polymer is within Applicants' claimed range (example 5a). Likewise, examples 3b and 4b in Table 4 show a similar pattern (although examples 7b and 8b do not show this pattern).

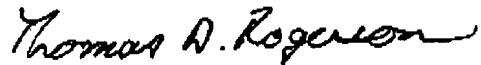
It is clear from Applicants' data presented in Tables 3-4, when compared with the data in Table 6, that the combination of the claimed first polymer with the second polymer results in a profound change in the film properties compared to the second polymer if used alone. Both '923 and '833 indicate that the "reshapability" of hair treated with the compositions disclosed in '923 and '833 is a function of the film properties of those compositions. As noted above, both '923 and '833 state that the composition of the (meth)acrylic copolymer may further comprise at least one constituent known in the cosmetic arts that "does not substantially interfere with the reshaping properties" of the (meth)acrylic copolymer. This statement teaches away from Applicants' claimed composition because it is clear that the addition of the first polymer to Applicants' second polymer does, in fact, markedly change the film properties of the second polymer. Furthermore, neither '923 nor '833 provide any direction on how to determine if an optional polymer substantially interferes with the reshaping properties, or even what is a "substantial interference".

Based upon the disclosures of '923 and '833, which disclose compositions comprising a low Tg (-100 to +15 deg. C.) copolymer of butyl (meth)acrylic and hydroxy alkyl (meth)acrylic

monomers, and optionally additional monomers, and into which one could add virtually any other component known to be useful in hair styling compositions, including other polymers, one skilled in the art would not be motivated to prepare the compositions of Applicant's invention.

With this response, Applicants believe that the claims are distinguished over the cited references and are now in condition for allowance. Should the Examiner have any suggestions which may put the Application in better condition for allowance, Applicants' attorney is willing to discuss any such suggestions either by phone or at the U. S. Patent and Trademark Office.

Respectfully submitted,



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Date: November 5, 2007